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Deputy Minister.

LABORATORY

OF THE

INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

BULLETIN No. 167

SPIRITUS AETHERIS NITROSI

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SPIRITUS AETHERIS NITROSI

OTTAWA, December 9, 1908.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I have the honour to report upon 77 samples of *Spiritus Aetheris Nitrosi* or Spirit of Nitrous Ether, collected throughout Canada in October last.

This important drug consists essentially of a solution of ethyl nitrite in alcohol. The directions given for its preparation in the British Pharmacopœia are such as to produce a solution answering the following official tests. Treated for decomposition of the nitrite, at normal temperature and pressure, it should yield, 'when freshly prepared, at least 6¼, but not more than 7, volumes of nitric oxide gas, corresponding to at least 2½ parts by weight of ethyl nitrite in 100 parts by weight of the spirit: and even after it has been kept for some time, and the vessel containing it has occasionally been opened, it should yield not much less than 5 times its volume of the gas, corresponding to nearly 2 per cent by weight of ethyl nitrite or a minimum of 1¾ per cent.'

The United States Pharmacopœia requires 4 per cent of ethyl nitrite in the freshly prepared article, corresponding to 11 times its volume of nitric oxide. The percentage content in ethyl nitrite, as given in the table of analyses, is calculated upon the basis of 4 per cent ethyl nitrite, equivalent to 11 volumes of nitric oxide.

It may be incidentally noted that Dr. Leech (The *Lancet*, London, Feb, 1889) has shown that this preparation owes its characteristic physiological properties to its content of ethyl nitrite. But, apart from this consideration, so long as the article remains pharmacopœal, it is the duty of this Department, as administering the Adulteration Act, to see that the requirements of the Pharmacopœias are met. The following percentages of ethyl nitrite are distinctly required by the pharmacopœias in question.

BRITISH PHARMACOPŒIA.

For freshly prepared Spirits of Nitrous Ether.

	Per cent.
Maximum	2·55
Minimum	2·27
For spirits 'kept some time, &c.'	
Minimum	1·75

Requires 4 per cent of ethyl nitrite.

I am compelled to pronounce all samples containing less than 1·75 per cent. of ethyl nitrite as adulterated under section 7 of the Adulteration Act (R.S. 1906. chap. 133).

It is well known that this preparation gradually loses its strength on keeping. The fact is expressly stated in the pharmacopœias. It follows that druggists should take proper precautions to enable them to guarantee the article which they dispense, as meeting at least, the minimum strength officially required. It will be seen that four (4) samples examined contain no ethyl nitrite whatever; while (15) fifteen others contain less than half of one per cent. A physician prescribing such an article would assuredly be disappointed in results; and when we bear in mind that this drug is 'much used in febrile conditions, to produce critical sweating; as a diuretic to relieve strangury produced by cantharides, in all painful affections of the urinary apparatus, whether occasioned by calculous or inflammatory disorders, and in affections of the kidneys, in which congestion of those organs occurs .... .. and to quiet nervous agitation,' we can realize, to some extent, the danger to the public which is involved in the failure of druggists to keep this drug up to pharmacopœal standards.

The samples now reported are classified as follows:—

	Samples.
Genuine	28
Adulterated	49
Total	77

It thus appears that above 63 per cent of these samples are adulterated.

The last examination of Spirits of Nitrous Ether was made in 1891, and the results published in Bulletin No. 23. On that occasion nine (9) samples were examined, and only three (3) were reported as up to standard strength.

It is evident that the retail druggist must be held responsible for the proper strength of this article since it is so liable to lose strength on keeping; especially when the container is frequently opened. The late Mr. Harrison, reporting upon samples examined by him in 1891, says:—'Samples which I prepared according to the B. P. process, and kept in glass-stoppered bottles, entirely filled, were of full strength after keeping one year; but after the bottle was opened, and on using out of it daily, it gradually deteriorated, so that I think it ought to be kept in bottles completely full, and with glass stoppers, and of such size that it will be disposed of in about a fortnight after being opened.'

I have the honour to be, Sir,
Your obedient servant,

A. McGILL,
Chief Analyst.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Costs.	Name and Address of Manufacturer or Furnisher as given by Vendor.
DISTRICT OF NOVA SCOTIA—						
1906.						
Oct. 13	Spirit of nitrous ether	33751	Geo. Friend, Sydney, N.S.	3 oz.	30	Nat. Drug. Co., Halifax, N.S.
" 13	" ..	33752	J. J. Turnbull, Sydney, N.S.	3 " ..	25	" " ..
" 15	" ..	33753	Crowe Bros., Truro, N.S.	3 " ..	25	E. Merck, Germany.....
" 15	" ..	33754	E. A. Smith, Truro, N.S.	3 " ..	25	Unknown.....
" 16	" ..	33755	A. V. Rand, Wolfville, N.S.	3 " ..	25	E. Merck.....
DISTRICT OF PRINCE EDWARD ISLAND—						
Oct. 29	Spirit of nitrous ether	31411	N. R. Bovyer, Crapaud....	3 oz.	30	Lyman Sons & Co., Montreal
" 29	" ..	31412	J. & G. Jamieson, Charlottetown.	3 " ..	30	" " ..
" 29	" .	31413	J. E. Gallant, Tignish.....	3 " ..	30	Nat. Drug Co., Halifax, N.S.
" 29	" ..	31414	McFayden & McLellan, Summerside.	3 " ..	30	Can. Drug Co., St. John, N.B.
" 29	" ..	31415	Edgar Keir, Kensington...	3 " ..	30	Howard & Son, Stratford, Eng.
DISTRICT OF NEW BRUNSWICK—						
Oct. 19	Spirit of nitrous ether	29844	Nat. Drug and Chemical Co., St. John, N.B.	3 oz.	25	Nat. Drug and Chemical Co., St. John, N.B.
" 21	" ..	29845	Wm. Hawker & Son, St. John, N.B.	3 " ..	30	Howard & Sons, Stratford, Eng.
Nov. 6	" ..	29846	Geo. O. Spencer, Moncton, N.B.	3 " ..	30	Not known.....
" 7	" ..	29847	T. J. Durick, Newcastle, N.B.	3 " ..	25	Evans Sons & Co., London, Eng.
" 18	" ..	29848	Chas. A. Burchill, Fredericton, N.B.	3 " ..	30	Nat. Drug and Chemical Co., St. John, N.B.
DISTRICT OF QUEBEC—						
Oct. 21	Spirit of nitrous ether	34478	F. E. Gilbert, Rivière du Loup.	3 oz.	30	Lyman & Son Montreal. ..
" 21	" ..	34479	S. O. Clouthier, Rivière du Loup.	3 " ..	30	W. Brunette et Cie, Quebec
" 21	" ..	34481	Wm. Kane, Rivière du Loup.	3 " ..	25	Lyman & Son Montreal. ..
Nov. 9	" ..	34491	Arthur Gagnon, Murray Bay.	4 " ..	32	W. Brunett Quebec.
" 9	" ..	34492	Dr. T. A. Lapointe, Murray Bay.	6 " ..	40	" ..
DISTRICT OF ST. HYA THE—						
Oct. 8	Spirit of nitrous ether	880	J. S. Trumble, Montreal.	3 oz.	35	Lyman Sons & Co. treal
" 12	" ..	881	Omer St. Amour, Ste. Agathe des Monts.	3 " ..	25	" ..
" 14	" .	882	T. Gaudet, Joliette	3 " ..	25	" ..
" 16	" ..	883	C. Denault, 73 St. Catherine, Vianville.	3 " ..	25	Lyman Knox & Co., real.
" 30	" ..	884	H. W. Reynolds, Montreal	3 " ..	25	Not known.....

AETHERIS NITROSI.

Inspector's Report.	Results of Analysis.				Remarks, and Opinion of the Chief Analyst.
	Nitric Oxide Vol. Gas. per cent.	Ratio, Vol. of Gas to Vol. of Liquid.	Per cent. Ethyl Nitrite.	—	
R. J. WAUGH, INSPECTOR.					
	p. c	p. c.	p. c.		
	4 80	4·8	1·73	Up to minimum standard....	Genuine.
	3 64	3·7	1·25	Below minimum standard....	Adulterated.
	1 70	1·7	0·62	" "	"
	5 20	5·2	1 80	Up to minimum standard....	Genuine.
	7 16	7·2	2·62	" "	"
THOS. MOORE, INSPECTOR.					
	0 0	0·0	0·0	Below minimum standard....	Adulterated.
	1 00	1·0	0·36	" "	"
	3 60	3·6	1·31	" "	"
	50	0·5	0·18	" "	"
	7 20	7·2	2·62	Up to standard.....	Genuine.
J. C. FERGUSON, INSPECTOR.					
Labelled by company.....	4 90	4·9	1·78	Up to standard.....	Genuine.
	3 50	3·5	1 28	Below minimum standard....	Adulterated.
	5 80	5·8	2·11	Up to standard.....	Genuine.
Furnished to vendor by Nat. Drug and Chemical Co.	6 30	6·3	2·29	"	"
Sample filled from original package.	5 48	5·5	2·00	"	"
E. BELAND, INSPECTOR.					
	2 00	2·0	0·73	Below minimum standard....	Adulterated.
	3 00	3·0	1·09	" "	"
	0 0	0·0	0·0	" "	"
	2 00	2·0	0·73	" "	"
	0	0·0	0·0	" "	"
J. C. ROULEAU, INSPECTOR.					
	1 90	1·9	0·69	Below minimum standard....	Adulterated.
	42	0·4	0 15	" "	"
	2 06	2·1	0·77	" "	"
	2 00	2·0	0·73	" "	"
	20	0·2	0·07	" "	"

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Cents.	Name and Address of Manufacturer or Furnisher as given by Vendor.
DISTRICT OF MONTREAL—						
Oct. 5	Spirit of nitrous ether	32776	Wright & Co. St. Johns, Que.	3 oz.	25	Lyman Sons & Co., Montreal
" 8	" ..	32777	P. E. Chevalier, Sorel, Que.	3 "	30	Not known.
" 8	" ..	32778	Dr. [illegible] Sorel,	3 "	25	Lyman, Knox & Co., Montreal.
" 9	" ..	32779	F. [illegible] Sherbrooke..	3 "	30	Nat. Drug and Chemical Co., Ltd., Montreal.
" 9	" ..	32780	D. [illegible] n, Sherbrooke..	3 "	25	Not known.
DISTRICT OF OTTAWA—						
Sept. 30	Spirit of nitrous ether	22701	Dr. J. W. McIntosh, Vankleek Hill.	3 oz.	25	Lyman Sons & Co., Montreal
Oct. 1	" ..	22702	John Channonhouse, Eganville.	3 "	25	Nat. Drug Co., Ottawa.
" 9	" ..	22703	D. J. Ritza, Renfrew.	3 "	25	Not known.
" 13	" ..	22704	W. A. Henderson, Ottawa.	3 "	30	Ottawa Drug Co., Ottawa ..
" 13	" ..	22705	Thos. A. Brownlee, Ottawa	3 "	30	Nat. Drug and Chemical Co., Ottawa.
DISTRICT OF KINGSTON—						
Oct. 29	Spirit of nitrous ether	36076	F. Hoag, Kingston.	3 oz.	15	H. Skinner, Kingston.
" 29	" ..	36077	A. P. Chown, Kingston.	3 "	30	" "
Nov. 3	" ..	36078	G. Watson, Port Hope.	3 "	15	Nat. Drug Co.
" 3	" ..	36079	H. W. Mitchell, Aort Hope	3 "	25	"
" 4	" ..	36080	E. Gregory, Lindsay.	3 "	15	Lyman, Toronto.
DISTRICT OF TORONTO—						
[illegible]						
Oct. 23	Spirit of nitrous ether	36146	Hennessy Drug Store, Ltd., Hamilton.	3 oz.	25	Dom. Drug Co., Ltd., Hamilton.
" 23	" ..	36147	Harry P. Leeter, Hamilton	3 "	25	" "
" 26	" ..	36148	H. A. Rowland, Toronto..	3 "	15	Lyman Bros. & Co., Toronto
" 26	" ..	36149	F. B. Bunting, Toronto.	3 "	30	The Drug Trading Co., "
" 27	" ..	36150	S. B. Pretty, Toronto.	3 "	15	Nat. Drug Co., Toronto.
DISTRICT OF LONDON—						
Oct. 7	Spirit of nitrous ether	30503	Geo. M. McKendrek, Kincardine.	3 oz.	30	J. Winer & Co., Hamilton..
" 7	" ..	30510	L. A. Hacking, Listowell..	3 "	15	Vendor.
" 12	" ..	30520	W. A. McConnell, Clinton	3 "	16	Canada Drug Co., London..
" 5	" ..	30984	S. A. Hicks, Goderich.	3 "	30	Not known.
" 6	" ..	30993	J. M. Hamilton, Blythe.	3 "	30	Nat. Drug Co., London, Ont.
" 6	" ..	30995	Walter McKibbon, Wingham.	3 "	30	The Drug Trading Co., Toronto.
" 8	" ..	30514	Chas. Aberhart, Seaforth..	3 "	30	Lyman Bros. & Co., Toronto

AETHERIS NITROSI.

Inspector's Report.	Results of Analysis.				Remarks, and Opinion of the Chief Analyst.
	Nitric Oxide Vol. Gas, per cent.	Ratio, Vol. of Gas to Vol. of Liquid.	Per cent. Ethyl Nitrite		
J. J. COSTIGAN, INSPECTOR.					
.....	1 70	1·7	0·62	Below minimum standard....	Adulterated.
.....	1 46	1·5	0·55	" "	"
.....	76	0·8	0·29	" "	"
.....	4 94	4·9	1·79	Up to minimum standard....	Genuine.
.....	1 10	1·1	0 40	Below minimum standard....	Adulterated.
J. A. RICKEY, INSPECTOR.					
Sold as spirit of nitrous ether	74	0·7	0·26	Below minimum standard....	Adulterated
" " ..	30	0·3	0·11	" "	"
Stock bought from former owner; sold as pure nitrous ether.	9 16	9 2	3·35	Up to standard.....	Genuine.
Vendor buys conc. spt. nth. nit. and dilutes with stronger alcohol; sold as spt. nth. nit.	9 34	9·3	3·38	"	"
Sold as spt. nth. nit.....	20	0·2	0 07	Below minimum standard....	Adulterated.
JAS. HOGAN, INSPECTOR.					
.....	10 00	10·0	3·64	Up to standard.....	Genuine.
.....	3 60	3·6	1·31	Below minimum standard....	Adulterated.
.....	60	0·6	0·22	" "	"
.....	74	0·7	0·26	" "	"
.....	Trace.	Trace.	Trace.	" "	"
H. J. DAGER, INSPECTOR.					
	p.c.	p.c.	p.c.		
.....	4 80	4·18	1·75	Up to minimum standard....	Genuine.
.....	10	0 1	0·04	Below "	Adulterated.
.....	2 46	2·5	0·91	" "	"
.....	5 44	5·4	1·97	Up to "	Genuine.
.....	Trace.	Trace.	Trace.	Below "	Adulterated.
T. RIDD, INSPECTOR.					
.....	1 96	1·8	0·66	Below minimum standard...	Adulterated.
Sample purchased from a boy who said they made same themselves.	0 0	0·0	0·0	" "	"
.....	1 70	1·7	0·62	" "	"
.....	4 0	0·4	0·15	" "	"
.....	3 50	3·5	1·28	" "	"
.....	5 00	5·6	2·04	Up to "	Genuine.
.....	3 80	3·8	1·38	Below "	Adulterated.

ÆTHERIS NITROSI.

Inspector's Report.	Results of Analysis.				Remarks, and Opinion of the Chief Analyst
	Nitric Oxide Gas. Vol. per cent.	Ratio, Vol. of Gas to Vol. of Liquid.	Per cent. Ethyl Nitrite.		
JNO. TALBOT, INSPECTOR.					
.....	7 04	7·0	2·55	Up to standard	Genuine.
.....	6 10	6·1	2·22	"	"
.....	2 16	2·2	0·80	Below minimum standard...	Adulterated
Made from concentrated ether	9 10	9·1	3·31	Up to standard.....	Genuine.
.....	3 90	3·9	1·42	Below minimum standard...	Adulterated.
A. C. LARIVIERE, INSPECTOR.					
.....	3 80	3·8	1·38	Below minimum standard...	Adulterated.
Sample from a bottle labelled sweet spirits of nitre. Speer-Stevenson Drug Co., Winnipeg, Man.	9 40	9·4	3·42	Up to standard.....	Genuine.
....	5 80	5·8	2·11	"	"
....	6 00	6·0	2·18	"	"
....	3 54	3·5	1·28	Below minimum standard...	Adulterated.
R. W. FLETCHER, INSPECTOR.					
.....	7 80	7·8	2·84	Up to standard	Genuine.
.....	1 56	1·6	0·58	Below minimum standard...	Adulterated.
.....	9 20	9·2	3·35	Up to standard.....	Genuine.
.....	2 00	2·0	0·73	Below minimum standard...	Adulterated.
....	1 80	1·8	0·66	" "	"
J. F. POWER, INSPECTOR.					
.....	1 44	1·4	0·51	Below minimum standard...	Adulterated.
.....	5 54	5·5	2·00	Up to standard.....	Genuine.
.....	3 50	3·5	1·28	Below minimum standard...	Adulterated.
....	2 90	2·9	1·06	" "	"
....	5 86	5·9	2·15	Up to standard..	Genuine.
D. O'SULLIVAN, INSPECTOR.					
....	3 40	3·4	1·24	Below minimum standard...	Adulterated.
.....	5 66	5·6	2·04	Up to standard.....	Genuine.
....	2 60	2·6	0·95	Below minimum standard...	Adulterated,
.....	10 24	10·2	3·71	Up to standard	Genuine,
....	5 12	5·1	1·86	" minimum standard...	"